Homework 2: Bundles

Due 11th July 2022

Question 1 (5 points)

1. Is $S^1 \times S^1$ parallelizable?
2. What about S^n, with n even?
3. Is S^2 a Lie group?

Question 2 (10 points)
Let P and Q be two principal G-bundles over the same space M. Show that any morphism from P to Q is necessarily an isomorphism.

Question 3 (5 points)
In your own words, explain the following concepts. Try and use as much natural language as you can – i.e. as little math notation as possible.

1. The construction of the tangent bundle
2. The fibres of a principal G-bundle
3. The frame bundle
4. Reduction of the structure group
5. Associated bundles